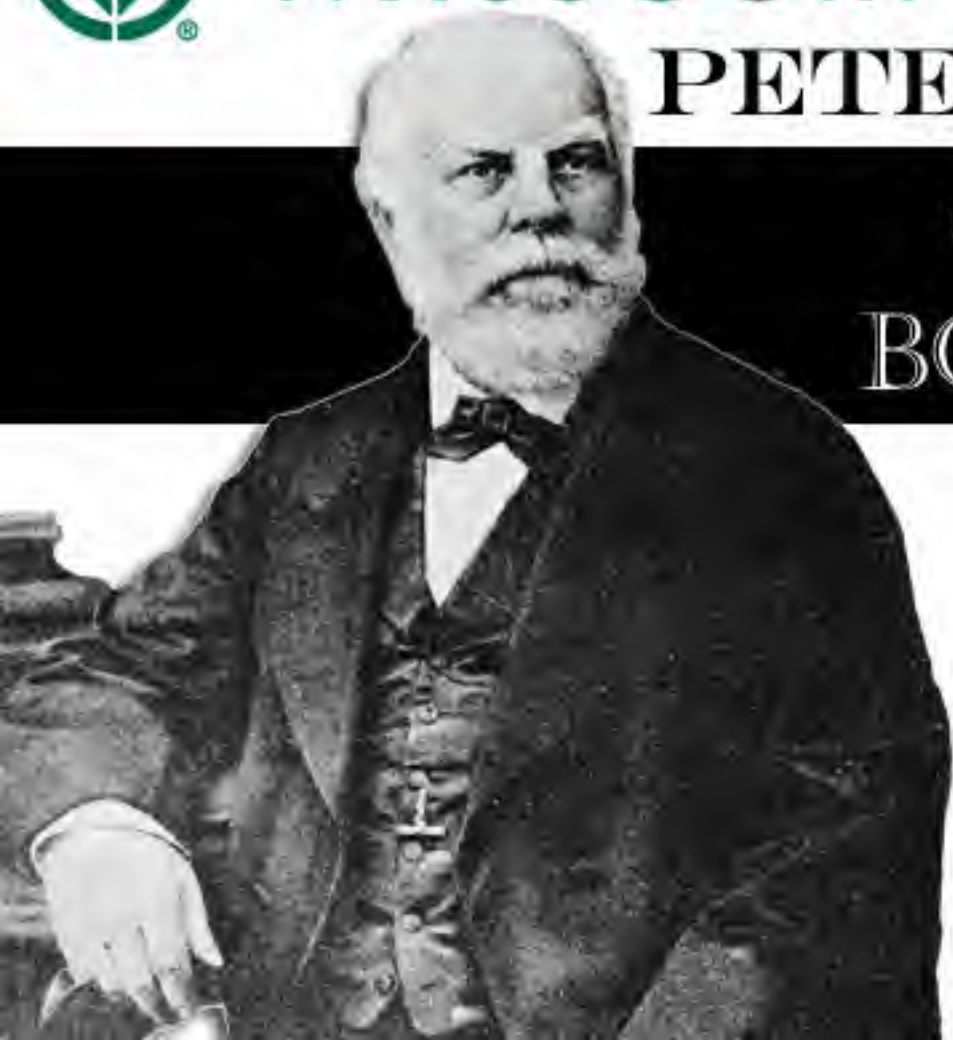


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BOTANICAL NOTEBOOKS



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P. tub

P. Engelmanni



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Abies Engelmannii

Pikes Peak

Dec. 1862

I



scales purple, squamose



x4



x4

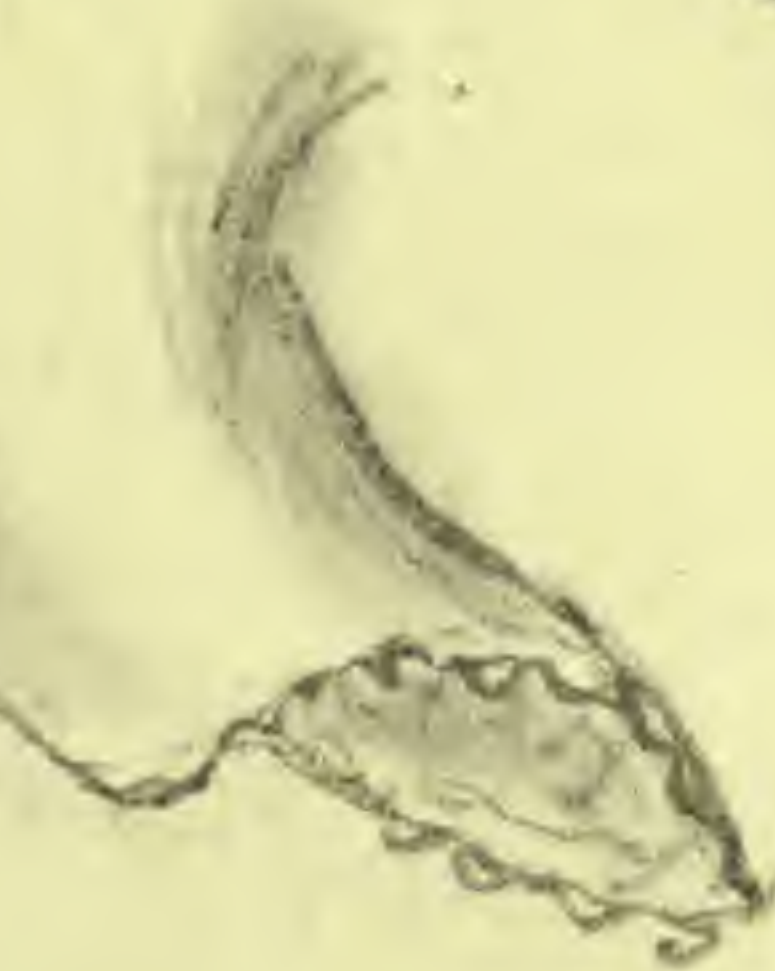
ovule

x30



x30

x60



x60

micropyle



x4



scales

x4

x30

both ovule
& ament




ALEX. LEITCH,
APOTHECARY & CHEMIST,
 Cor. 4th and Olive Sts., St. Louis.

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a

Abies Engelmannii Parry

Octob 8, 62

x4



dorsal

x4



base of leaves



upper
side



sect of
leaf x30



over



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GARDEN

12432

M. W. ALEXANDER,

SOUTH-EAST CORNER OF FOURTH AND MARKET STREETS,

ST. LOUIS.

leaves of fertile branches about 8 lines long,
 less than 1 line wide, on a persistent
 (pulvillus) base $\frac{1}{2}$ over $\frac{1}{2}$ line in length, strongly
 carinate on back, less so on the upper
 side, white dotted & lined on the upper side
 in the furrows between the ^{round thick} edges and the
 back, green on the back — often incurved,
 acutish

Cones ovoid ~~pendulous~~ on long peduncles or
 rather branches

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e

Nov 1862

Headwaters of Columbian
River

L. Mayer

Aug 1860



x 2



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C,

Abies Engelmannii

Summit of White River

Mts

Dr Hayden

7 June 1860

Nov 1862



X2



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Abies Engelmannii

Nov 1862

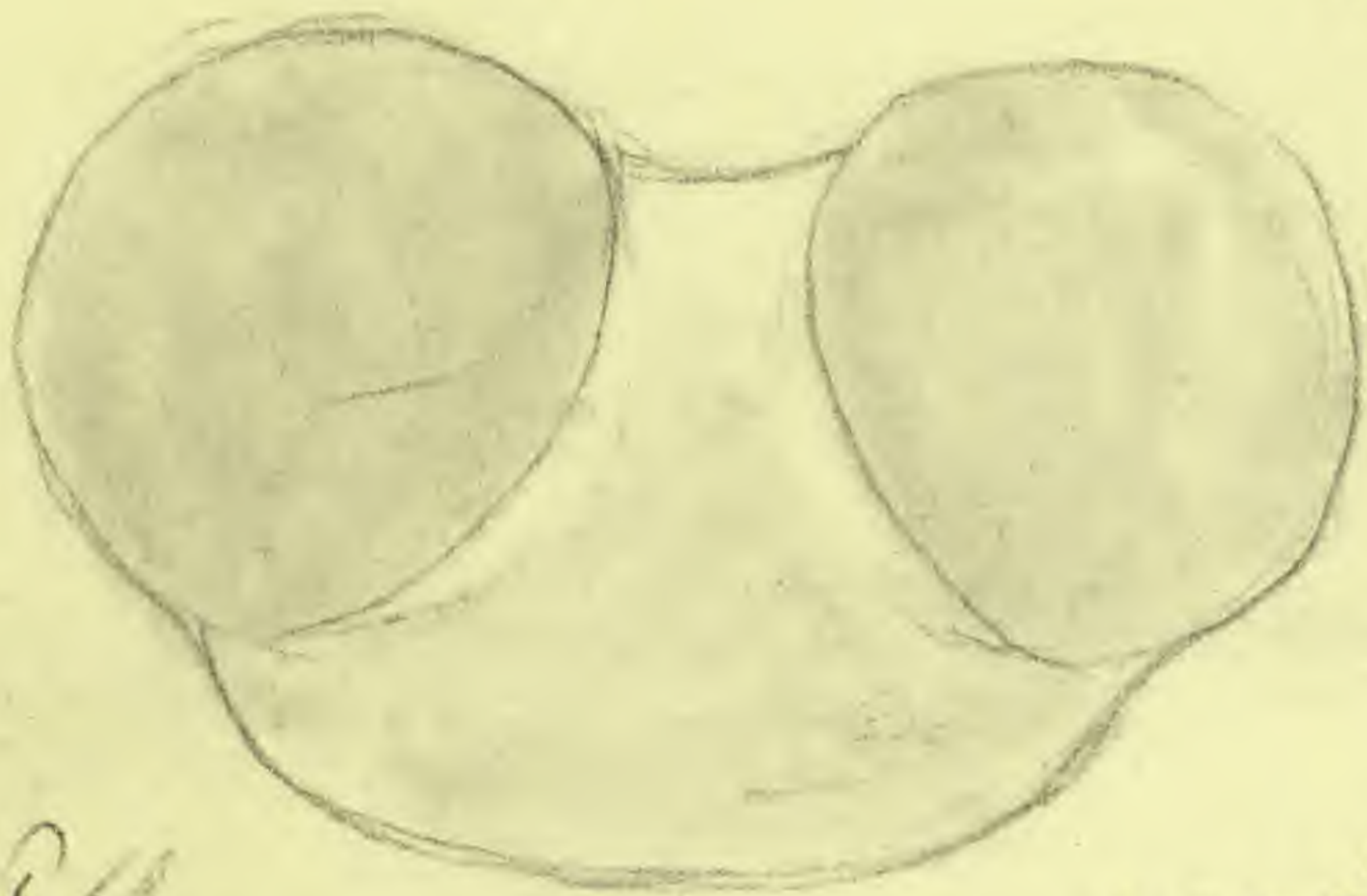
Nov 1862



x 10



x 415



Pollen

0.053 mm



male ament



x 4



young ament.
on top of branch



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cm

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415 — 2200 / 0.059
 2075
 1250

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0.023 in

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Abies Engelmannii
Big Horn Mountains

Nov. 1862

L. Engelmann 1859



x 2

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GEORGE ENGELMANN PAPERS
DEPT. OF BOTANICAL GARDEN

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS
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21

Ch.

Eng

Nov 62

3 rows,
Perry



x2

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x10



6 styles
acute

Spec from lower
Mountains
Perry 1862



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a,

Sept 1862

A. Lyallii - Parry (1)

Nov 1862

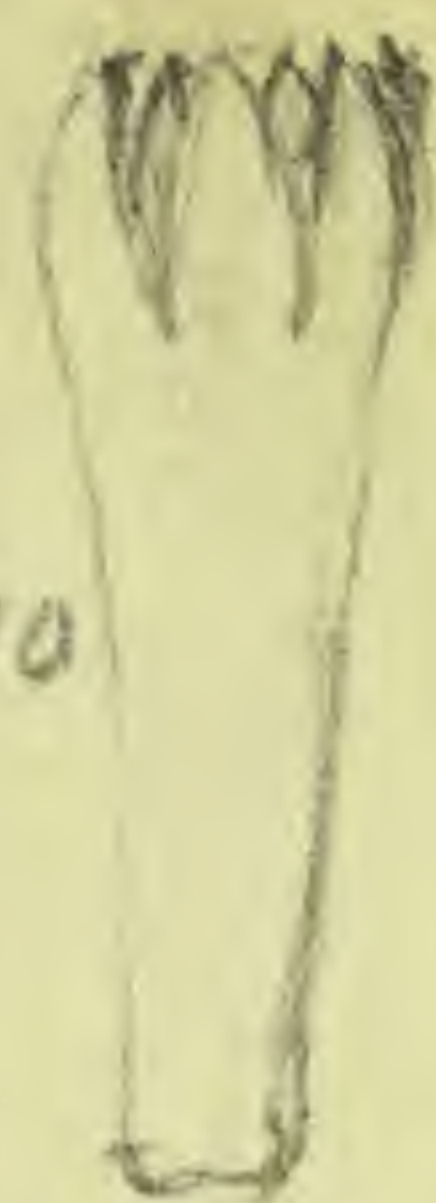
forma alpina

(spec. with bark)

$\frac{8}{13}$



x 10



Cotyl 6

(rarely 5)



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7 Feb

P. purpureus



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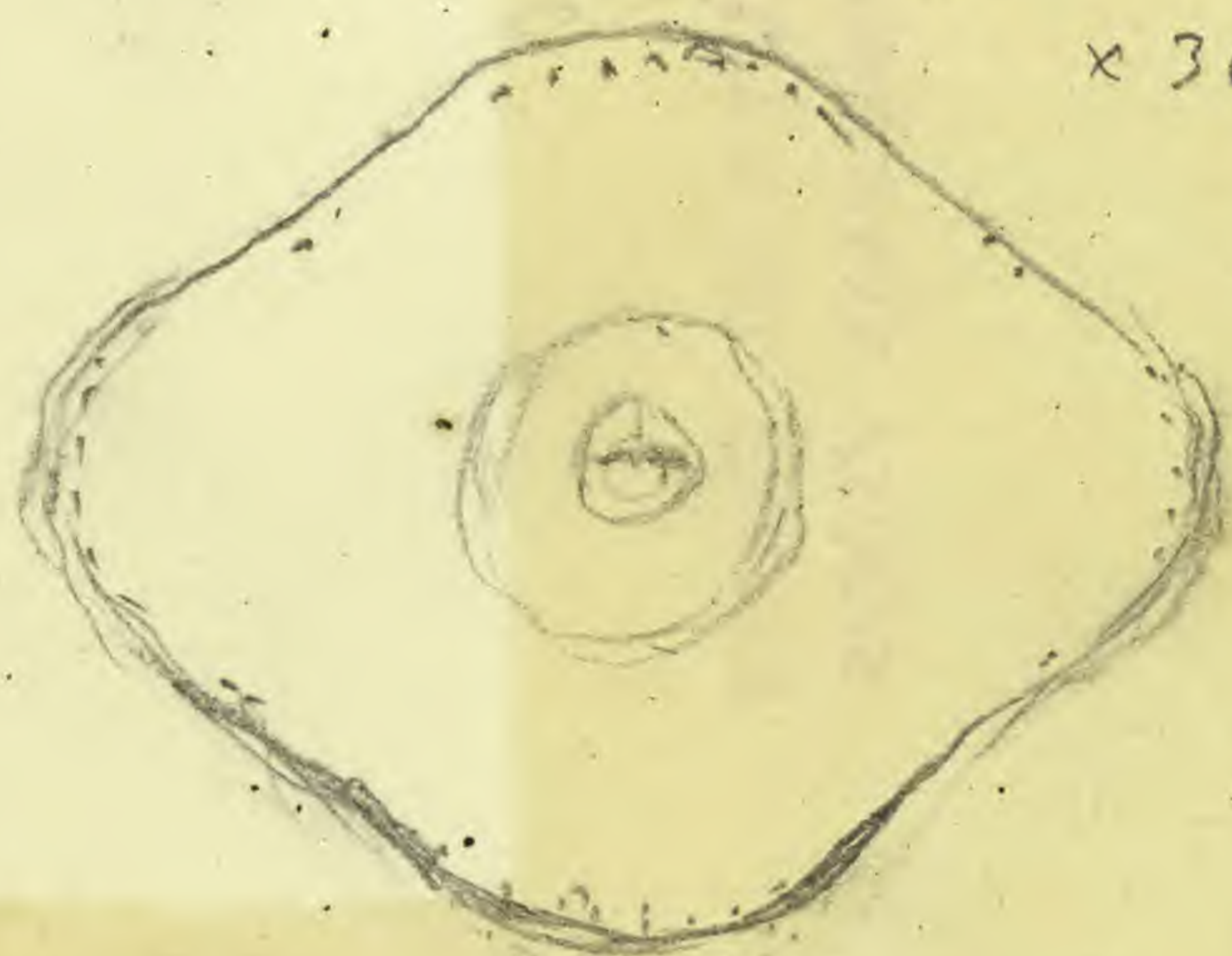
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cones very small *Picea pungens* Oct 21 1879
var. *puberula*
South Utah, Siler



x 30 about 6 series of stomata
on each side above

about 4-6 —
on each side below



0 1 2 3 4 5 6 7 8 9 10

cm

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APOTHECARY,

No. 2600 Laclede Ave., S. W. Cor. Jefferson Ave.,
ST. LOUIS, MO.

No. Date, 187

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GEORGE ENGELMANN PAPERS

Geo. Engelmann, M. D.,
No. 3003 Locust Street.

12440



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Picea pungens

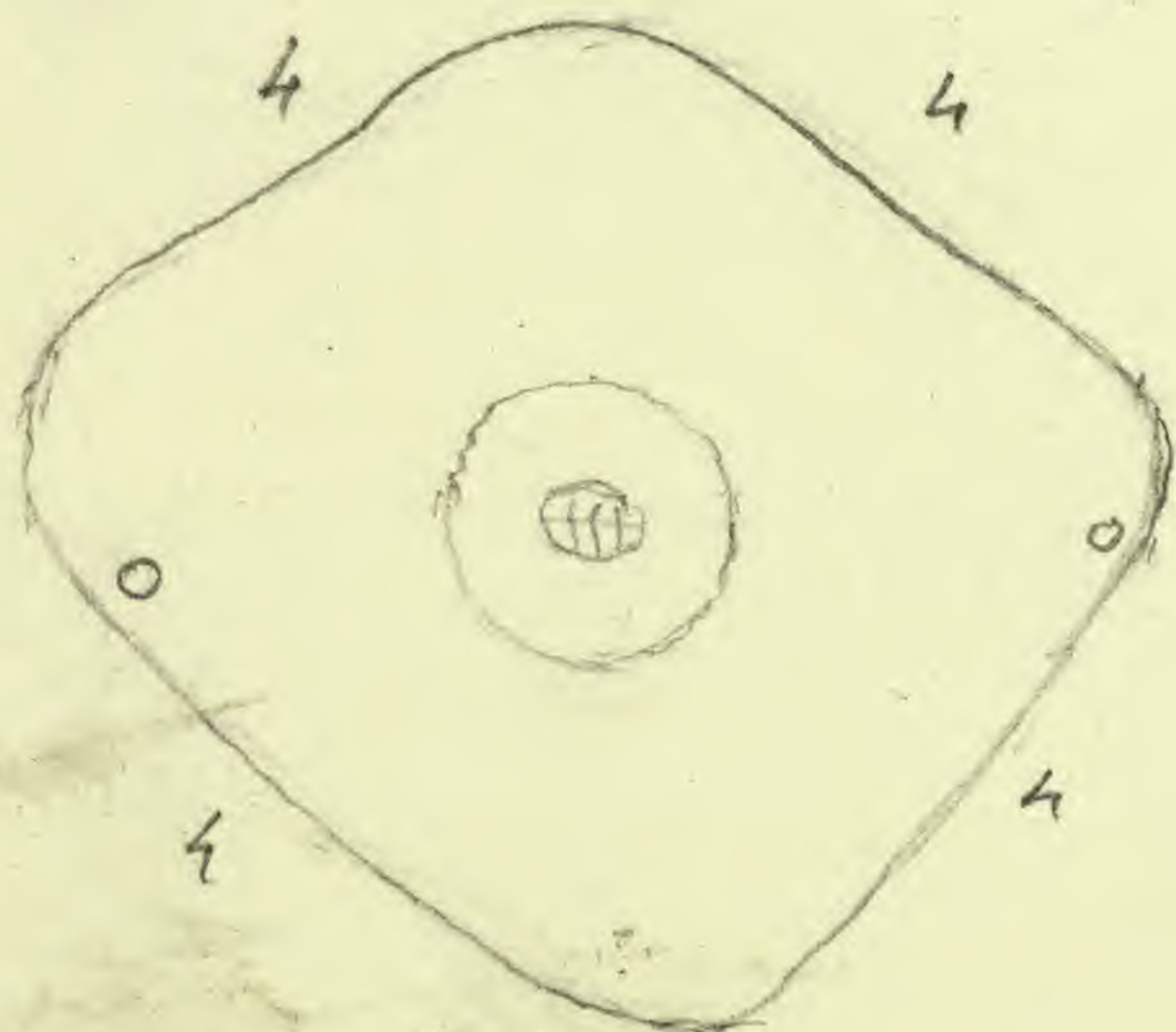
but pubescent beneath

June 9 1879

foliis quadratis

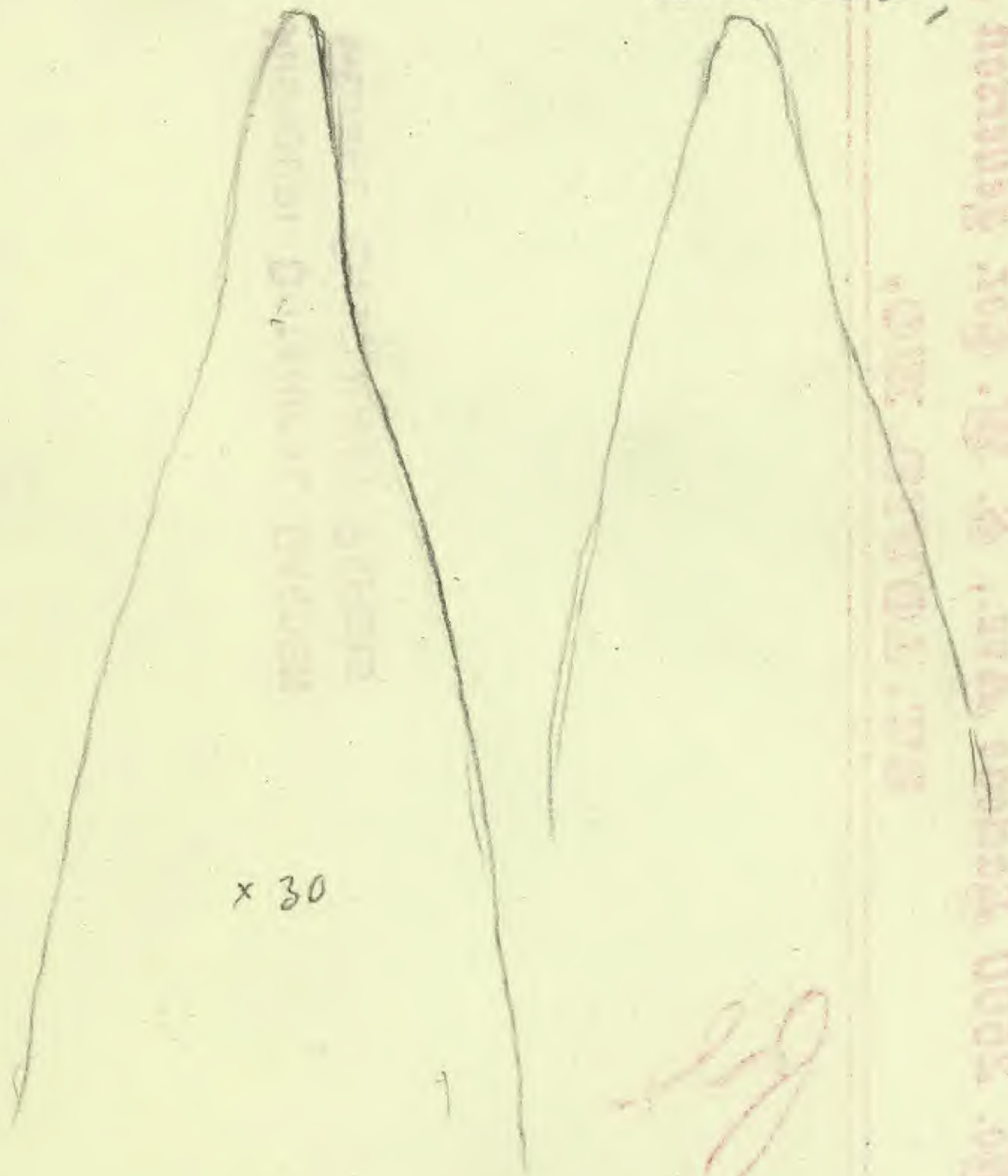
Wassaleh, A. S. Siler
1879

x 30



4 rows of stomata on each
of the 4 sides
only 5 incomplete rows
above

x 30



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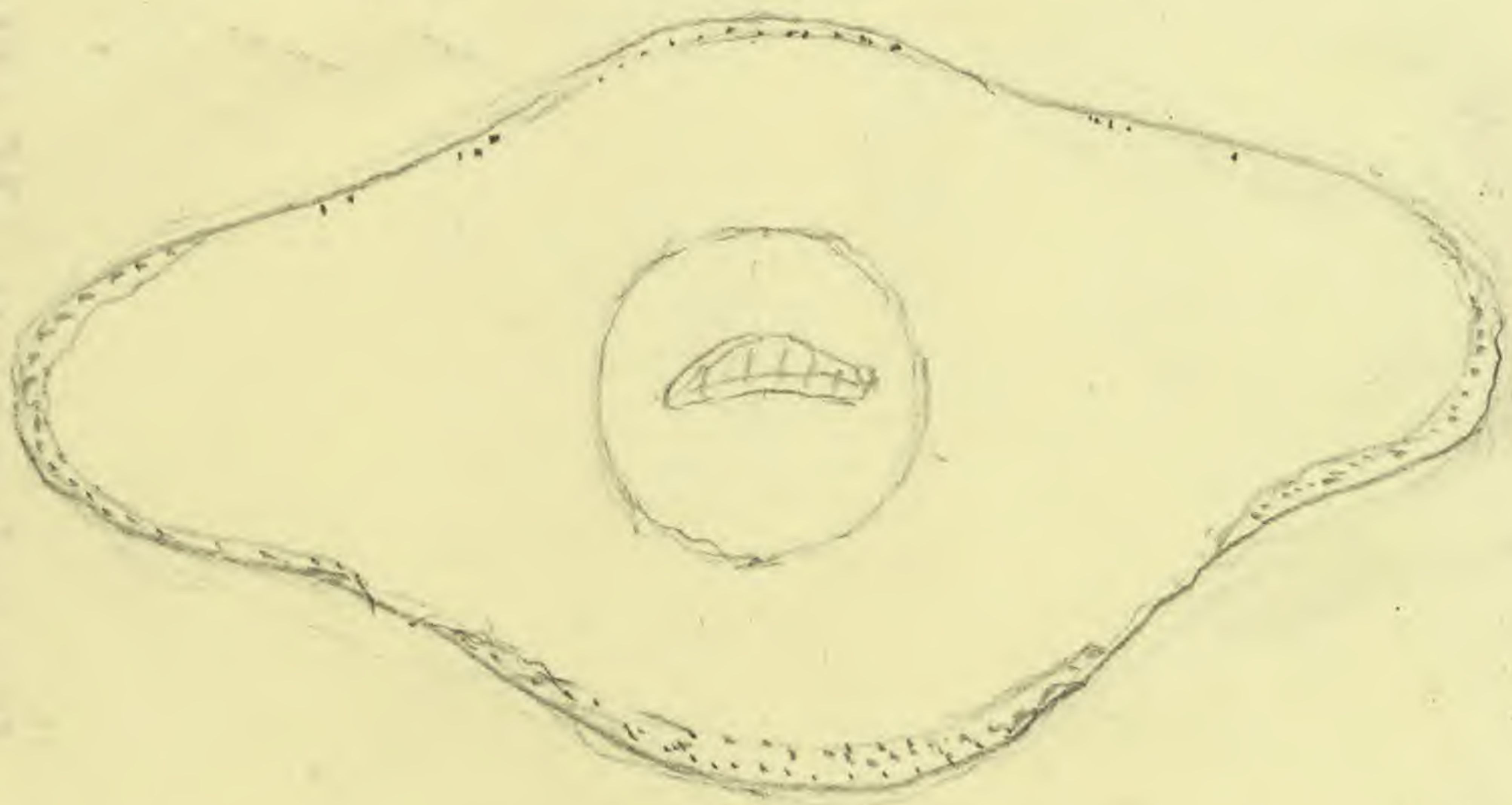
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Pilea Menziesii ?

May 3^d 1878

Wind River Mountains, Hayden

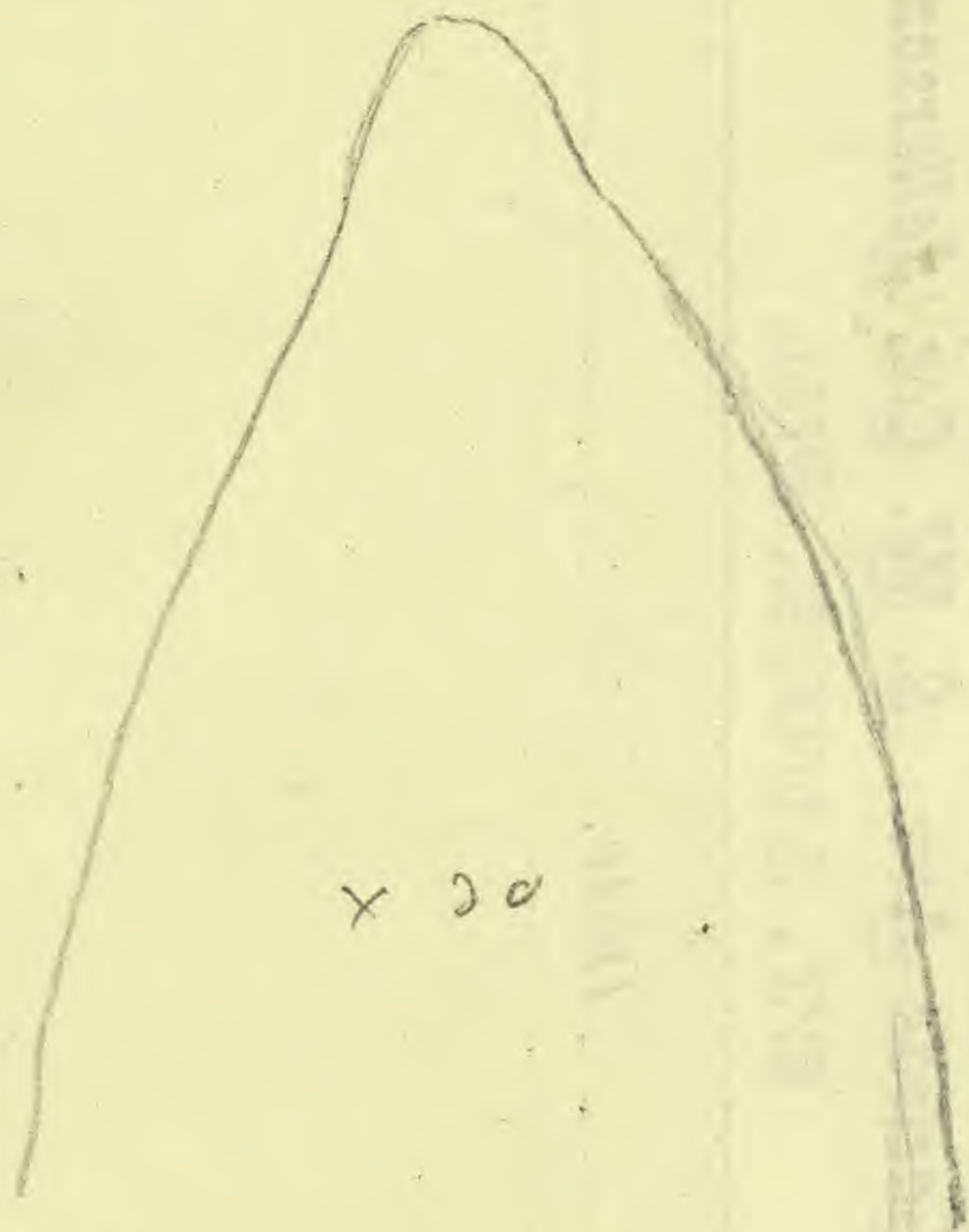
x 30



hypoderm on angles, but less than
in *menziesii*

also on under surface
and a few scattered cells above
no hypoderm cells within sheath

x 30



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Picea menziesii

Colorado 1870

very nice.

April 29 1871

x30

x30

no ar. ducts
- these leaves

sections of
different leaves
bundles of vessels
very small

well and correctly drawn!
stronger carina mostly below
sometimes upwards!



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Apothecaries & Chemists,

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Abies Menziesii
 Colorado Parry 1862

Nov 1862

x 10



6 (rarely 7)
 Cotyledons



upper or
 inner side

x 2



lower side
 toward scale



seed not half as long
 as scale!

scales 13
 / 21



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"*Abies menziesii*"

Jun 16 1878

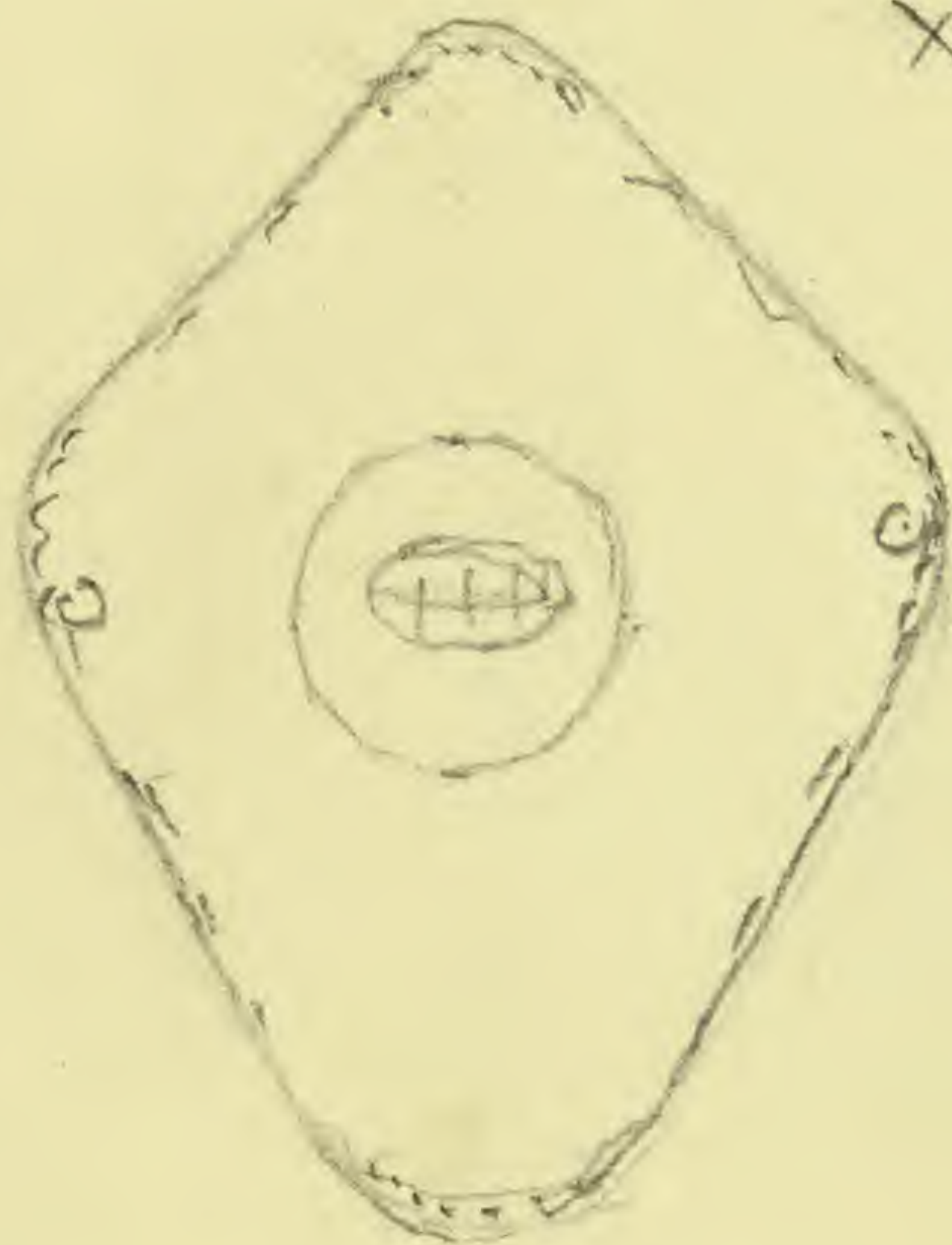
from Colorado

fresh

Her J. Hoopes.

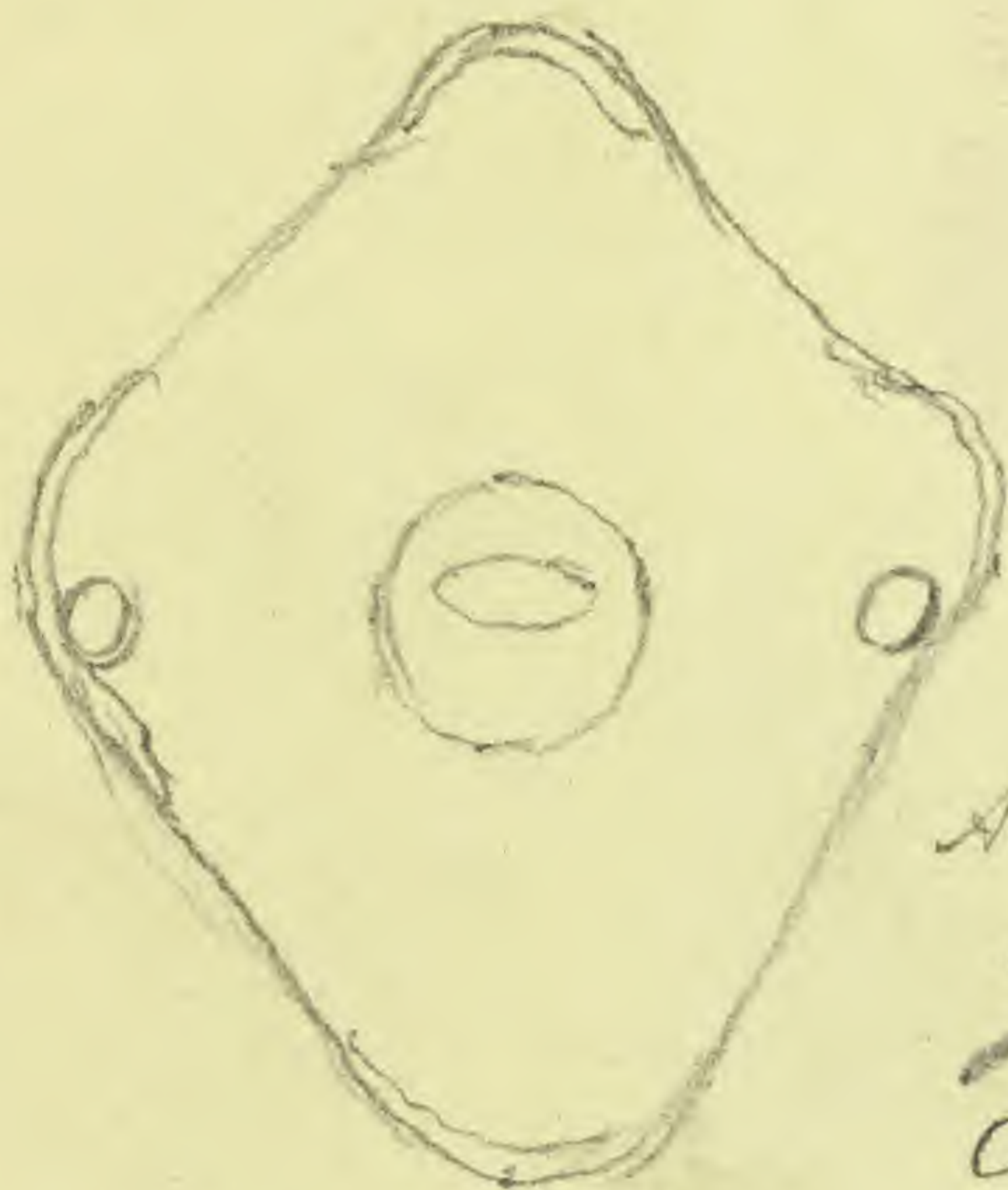
Jun 1878 J. Hoopes

x 30



of only one dent
mostly absent

dent mostly absent



form viridis

A. menziesii
young trees

Cambridge

Sargent

Jun 1878

fresh



form glauca



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May 1862

Abies Menziesii

S. Parry 1861

Colorado



very young cone
scales membranaceous
squarrose, (somewhat
reflexed)

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

PRINTED AND BOUND BY J. H. MANNING, ST. LOUIS, MO.

ABIES MENZIESII AND CHEMISII.

VICTOR VEITCH



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**ARTHUR LETTCH,
APOTHECARY AND CHEMIST,**

Sixth and Market streets, St. Louis, Mo.

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Abies Menziesii

Colorado Pamy

Dec. 1864



x 10



x 10



ovules

soon after fertilization

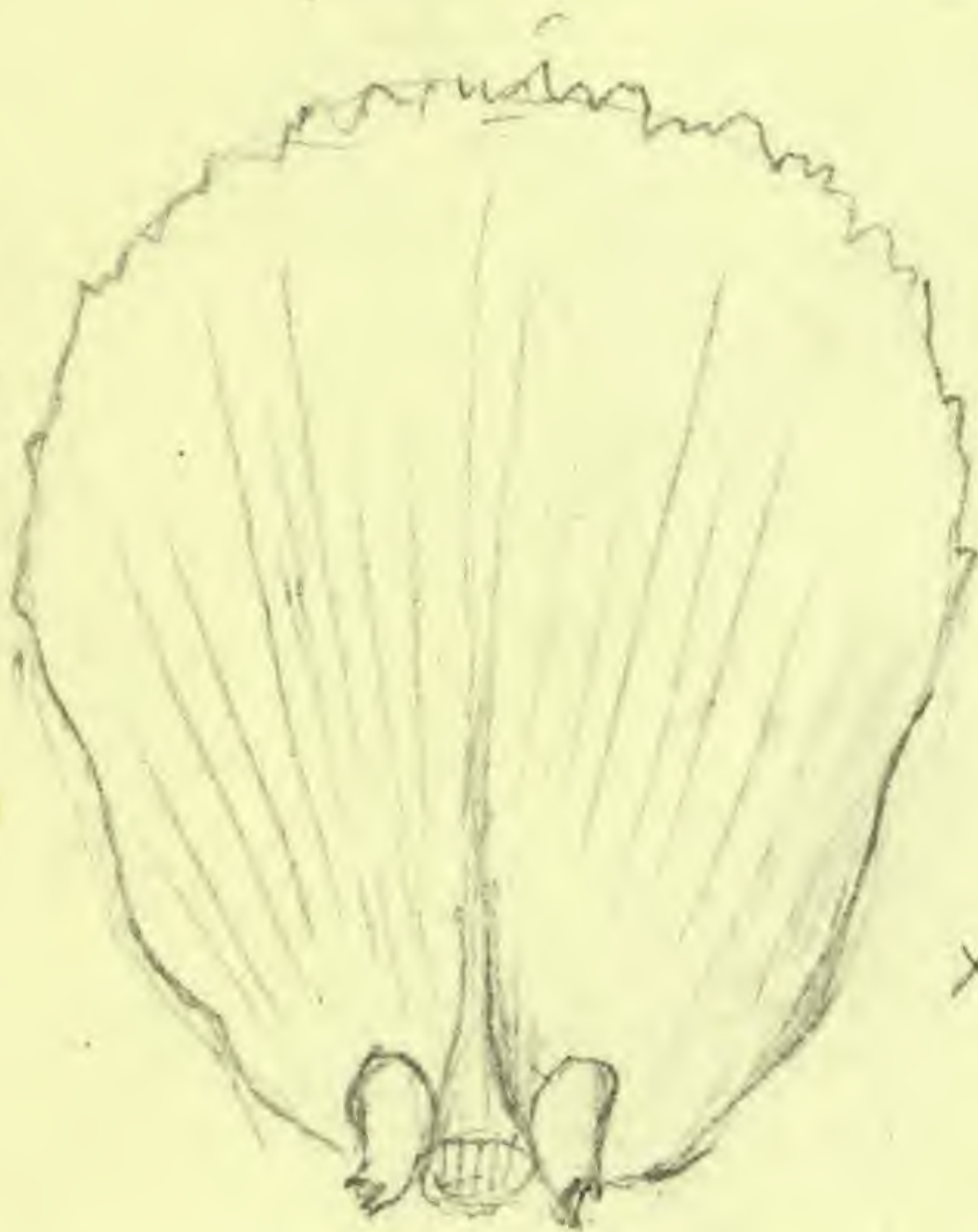


x 415

5,060



x 4



x 4



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